W2	Learning Area	SCIENCE	Grade Level	GRADE 8
	Quarter	FOUR	Date	4 DAYS

I. LESSON TITLE	STAGES OF MITOSIS AND MEIOSIS
II. MOST ESSENTIAL LEARNING COMPETENCIES (MELCs)	1.Compare mitosis and meiosis, and their role in the cell-division cycle. S8LT-IVd16 2.Explain the significance of meiosis in maintaining the chromosome number. S8LT-IVd17
III. CONTENT/CORE CONTENT	Heredity: Inheritance and Variation of Traits

IV. LEARNING PHASES AND LEARNING ACTIVITIES

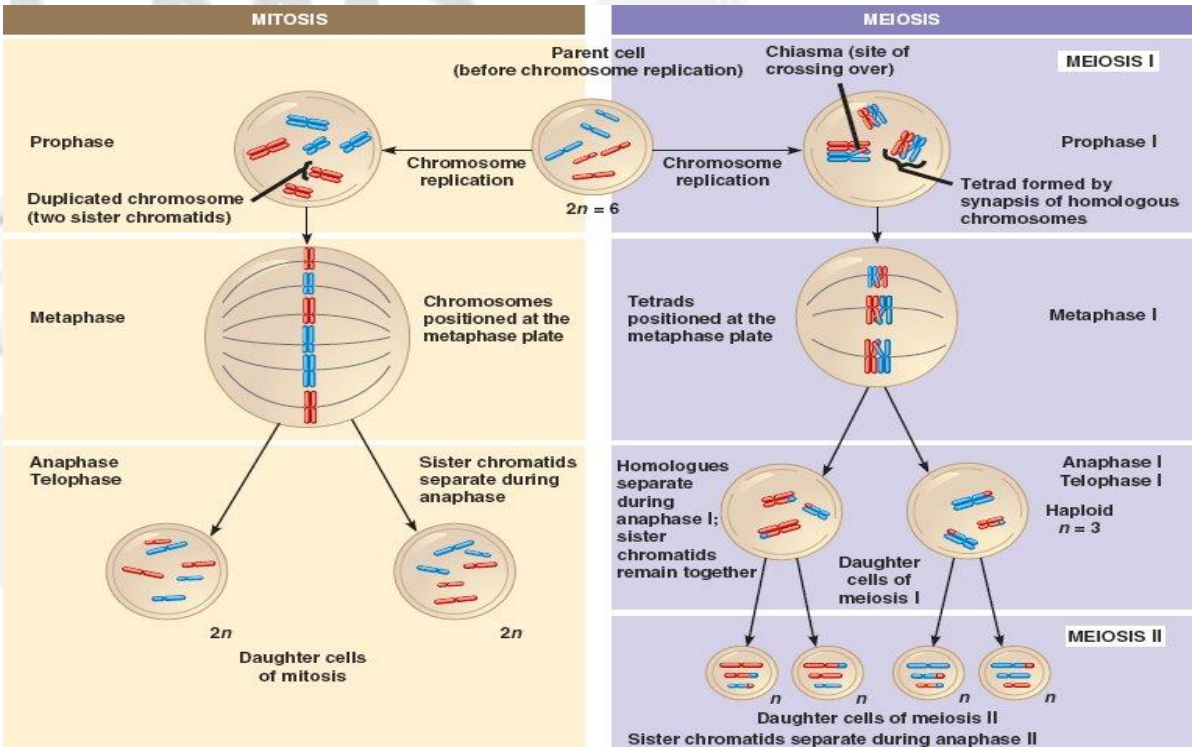
I. Introduction (Time Frame: DAY 1)

How much did you weigh when you were born? How long were you? Your body needed millions of new cells to become as large as you are now!
It's very likely that each time you go to the doctor, a nurse measures your height and weight. This activity gives the medical profession an idea of how people grow. Much of the growth happens because the number of cells in your body increases as you develop.
Most of the kinds of cells in your body are constantly replacing themselves. Bone cells make new bone cells. Muscle cells make new muscle cells. The fact is that you are constantly changing. You aren't the same now as you were a year ago or even a few hours ago.
At this very moment, as you read this module, groups of cells throughout your body are growing, dividing, and dying. Worn out cells on the palms of your hands are being replaced. Cuts and bruises are healing. Other organisms undergo similar processes.

How does this happen?

There are two ways by which cells increase in number:

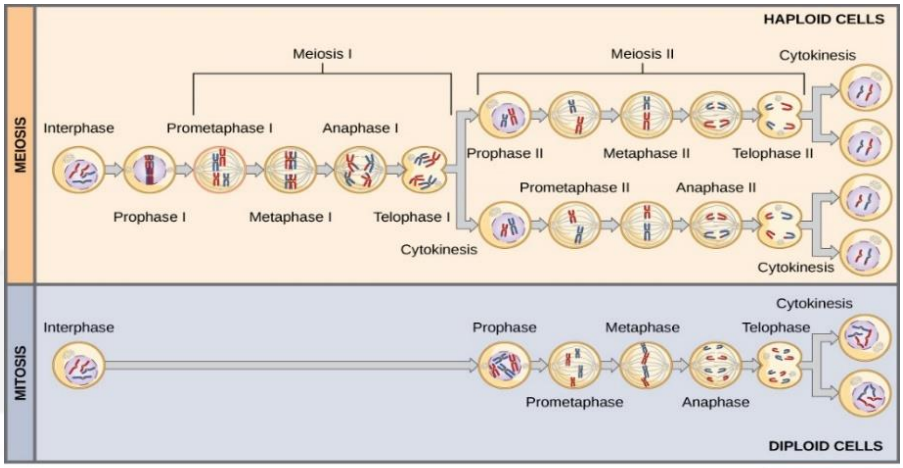
- **Mitosis** – is the process in which a cell nucleus divides into two new nuclei, each of which contains the same number of chromosomes as the parent cell. The parent cell is the cell that undergoes division. This process occurs on the body (somatic) cells.
- **Meiosis** – s a process where a single cell divides twice to produce four cells containing half the original amount of genetic information. These cells are our sex cells – sperm in males, eggs in females.



IV. LEARNING PHASES AND LEARNING ACTIVITIES

D. Development (Time Frame: DAY 2)

Comparing Meiosis and Mitosis



						OUTCOME
PROCESS	DNA synthesis	Synapsis of homologous chromosomes	Crossover	Homologous chromosomes line up at metaphase plate	Sister chromatids line up at metaphase plate	Number and genetic composition of daughter cells
MEIOSIS	Occurs in S phase of interphase	During prophase I	During prophase I	During metaphase I	During metaphase II	Four haploid cells at the end of meiosis II
MITOSIS	Occurs in S phase of interphase	Does not occur in mitosis	Does not occur in mitosis	Does not occur in mitosis	During metaphase	Two diploid cells at the end of mitosis

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Learning Task 1 Compare and contrast mitosis and meiosis by filling up the table below. Answer this on a separate sheet of paper.

COMPARISON	**MITOSIS**	**MEIOSIS**
Purpose		
Number of parent cells		
Number of divisions		
Number of cells produced		
Chromosome sets (=n)		
Type of cells that undergo cell division		

IV. LEARNING PHASES AND LEARNING ACTIVITIES

E. Engagement (Time Frame: DAY 3)

Learning Task 2 CRITICAL WRITING

Read these passages from the text and answer the questions that follow. Write your answers on a separate sheet of paper.

Meiosis

The process that produces haploid gametes is meiosis. Meiosis is a type of cell division in which the number of chromosomes is reduced by half. It occurs only in certain special cells of the organisms. During meiosis, homologous chromosomes separate, and the haploid cells that form have only one chromosome from each pair. Two cell divisions occur during meiosis, and a total of four haploid cells are produced. The two cell divisions are called meiosis I and meiosis II.

Phases of Meiosis

Meiosis I begins after DNA replicates during interphase. In both meiosis I and meiosis II, cells go through the same four phases as mitosis. However, there are important differences between meiosis I and mitosis.

Meiosis I

1. **Prophase I**: The nuclear envelope begins to break down, and the chromosomes condense. Centrioles start moving to opposite poles of the cell, and a spindle begins to form. Importantly, homologous chromosomes pair up, which is unique to prophase I. In prophase of mitosis and meiosis II, homologous chromosomes do not form pairs in this way.
2. **Metaphase I**: Spindle fibers attach to the paired homologous chromosomes. The paired chromosomes line up along the equator of the cell. This occurs only in metaphase I. In metaphase of mitosis and meiosis II, it is sister chromatids that line up along the equator of the cell.
3. **Anaphase I**: Spindle fibers shorten, and the chromosomes of each homologous pair start to separate from each other. One chromosome of each pair moves toward one pole of the cell, and the other chromosome moves toward the opposite pole.
4. **Telophase I and Cytokinesis**: The spindle breaks down, and new nuclear membranes form. The cytoplasm of the cell divides, and two haploid daughter cells result. The daughter cells each have a random assortment of chromosomes, with one from each homologous pair. Both daughter cells go on to meiosis II.

Meiosis II

1. **Prophase II**: The nuclear envelope breaks down and the spindle begins to form in each haploid daughter cell from meiosis I. The centrioles also start to separate.
2. **Metaphase II**: Spindle fibers line up the sister chromatids of each chromosome along the equator of the cell.
3. **Anaphase I**I: Sister chromatids separate and move to opposite poles.
4. **Telophase II and Cytokinesis**: The spindle breaks down, and new nuclear membranes form. The cytoplasm of each cell divides, and four haploid cells result. Each cell has a unique combination of chromosomes.

Questions

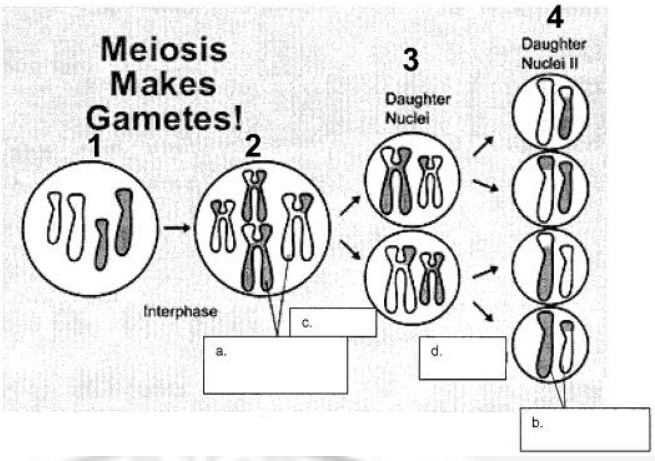
1. Define meiosis.
2. Is the DNA replicated after meiosis I? Why or why not?
3. Describe the main difference between metaphase I and metaphase II.
4. State the phase where each of the following processes occurs: (a) sister chromatids separate, (b)homologous chromosomes form pairs, (c) two haploid cells form.
5. What is final product of meiosis?

IV. LEARNING PHASES AND LEARNING ACTIVITIES

A. Assimilation (Time Frame: DAY 4)

Learning Task 3

Fill in the boxes below with the following words: **meiosis I**, **meiosis II**, **sister chromatids, homologous chromosomes.**



https://www.chegg.com/homework-help/questions-and-answers/fill-boxes-following-words-meiosis-meiosis-ii-sister-chromatids-homologous-chromosomes-des-q21980991

VI. REFLECTION (Time Frame: DAY 4)

- Communicate your personal assessment as indicated in the Learner's Assessment Card.

Personal Assessment on Learner's Level of Performance

Using the symbols below, choose one which best describes your experience in working on each given task. Draw it in the column for Level of Performance (LP). Be guided by the descriptions below:

☆ - I was able to do/perform the task without any difficulty. The task helped me in understanding the target content/ lesson.

✓ - I was able to do/perform the task. It was quite challenging, but it still helped me in understanding the target content/lesson.

ʔ – I was not able to do/perform the task. It was extremely difficult. I need additional enrichment activities to be able to do/perform this task.

Learning Task	LP	Learning Task	LP	Learning Task	LP	Learning Task	LP
Number 1		Number 3		Number 5		Number 7	
Number 2		Number 4		Number 6		Number 8	

VII. REFERENCES

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